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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/655,901	09/05/2003	Youichi Akasaka	2460	7660

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EXAMINER

HUGHES, DEANDRA M

ART UNIT	PAPER NUMBER
3663	

DATE MAILED: 09/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/655,901

Applicant(s)

AKASAKA, YOUICHI

Examiner

Deandra M. Hughes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/18/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) filed on Jan. 18, 2005 has been considered by the examiner. However, citation #1 has been lined through because the US PG Publication No. appears to be incorrect. The cited number does not corresponded to the Name of the Patentee, i.e. Grubb et al.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4 and 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Grubb (US 6,344,922 published Feb. 5, 2002).

**The references made herein are done so for the convenience of the applicant. They are in no way intended to be limiting. The prior art should be considered in its entirety.

With regard to claim 1, Grubb discloses a communication system (fig. 5a) for distributed Raman amplification of optical signals (col. 2, lines 28-42), the communication system comprising:

- a first fiber span (1st instance of #30);
- a second fiber span (2nd instance of #30);

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- and an amplifier system (2nd instance of #24, #26 and #31₁-#31_n) configured to:
 - o generate a first light beam (multiplexed via 2nd instance of #26; pumps #31₁-#31_n);
 - o split (via 2nd instance of #24) the first light beam into a first portion of the first light beam (coupled via 3rd instance of #26) and a second portion of the first light beam (coupled via 4th instance of #26);
 - o transfer the first portion of the first light beam onto the first fiber span to backward propagate over the first fiber span (first portion counter-propagates in 1st instance of #30);
 - o and transfer the second portion of the first light beam onto the second fiber span to forward propagate over the second fiber span (2nd portion co-propagates in 2nd instance of #30).

With regard to claim 2, the 1st pump system is #31₁-#31_n and the 1st splitter system is #24.

With regard to claim 3, the 2nd pump system is the 3rd instance of #31₁-#31_n and the third fiber span is the 2nd instance of #28.

With regard to claim 4, col. 12, line 35 discloses the claimed gain.

Claims 11-14 are merely the method of normal operations of the apparatus as claimed.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5-6, 8, 15-16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grubb (US 6,344,922 published Feb. 5, 2002) in view of Fidric (US 6,603,593 published Sep. 19, 2001).

With regard to claims 5 and 16, Grubb does not specifically disclose that a laser diode is configured to generate the first light beam. However, laser diodes as Raman pump sources are well known in the art. Further, it is taught by Fidric (col. 3, lines 20-25). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to use a laser diode as a Raman pump source for the advantage of an inexpensive and readily available art-recognized pump source.

With regard to claims 6, 8, 15, and 18, Grubb does not specifically disclose that the splitter is a 3dB splitter. However, Fidric teaches the use of a 3dB splitter (#20). It is well-known in the art that a 3dB splitter is so named because an equal division (50/50) of an input signal between two output ports causes a 3dB loss. It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to use a 3 dB splitter for the advantage of an inexpensive readily available splitter to even distribute the pump power signal.

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6. Claims 7, 9-10, 17, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grubb (US 6,344,922 published Feb. 5, 2002) in view of Agrawal (Fiber-Optic Communication Systems, 2002).

Grubb does not specifically disclose the claimed transmission fiber lengths or pump powers. However, Grubb discloses that one of ordinary skill in the art may construct an amplifier with a desired signal amplification range by varying the length and the pump powers. Further, Agrawal explicitly teaches these relations (pg. 244 - equations 6.3.2 and 6.3.3; pg. 245 - equation 6.3.5). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to merely apply the explicit relations of Agrawal to the amplifier of Grubb for the advantage of optimizing amplification to achieve the desired signal amplification range.

Conclusion


7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Akasaka, Avallone, Bartolini, Islam, and Okuno disclose split pump configurations for Raman amplifiers.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M. Hughes whose telephone number is 571-272-6982. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Deandra M Hughes
Examiner
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